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Stephanie Winner , Mike Kelley , Brent Pease , Bill Rivard , Alex Yen
Proceedings of the 24th annual conference on Computer graphics and interactive techniques
August 1997

2 Session 3: light: Opacity light fields: interactive rendering of surface light fields with view-dependent opacity 85%
Daniel Vlasic , Hanspeter Pfister , Sergey Molinov , Radek Grzeszczuk , Wojciech Matusik
Proceedings of the 2003 symposium on Interactive 3D graphics April 2003
We present new hardware-accelerated techniques for rendering surface light fields with opacity hulls that allow for interactive visualization of objects that have complex reflectance properties and elaborate geometrical details. The opacity hull is a shape enclosing the object with view-dependent opacity parameterized onto that shape. We call the combination of opacity hulls and surface light fields the *opacity light field*. Opacity light fields are ideally suited for rendering of the visu ...

3 Delay streams for graphics hardware 82%
Timo Aila , Ville Miettinen , Petri Nordlund
ACM Transactions on Graphics (TOG) July 2003
Volume 22 Issue 3
In causal processes decisions do not depend on future data. Many well-known problems, such as occlusion culling, order-independent transparency and edge antialiasing cannot be properly solved using the traditional causal rendering architectures, because future data may change the interpretation of current events.We propose adding a *delay stream* between the vertex and pixel processing units. While a triangle resides in the delay stream, subsequent triangles generate occlusion information. ...

4 Surface splatting 82%
Matthias Zwicker , Hanspeter Pfister , Jeroen van Baar , Markus Gross
Proceedings of the 28th annual conference on Computer graphics and interactive techniques
August 2001

Modern laser range and optical scanners need rendering techniques that can handle millions of points with high resolution textures. This paper describes a point rendering and texture filtering technique called *surface splatting* which directly renders opaque and transparent surfaces from point clouds without connectivity. It is based on a novel screen space formulation of the Elliptical Weighted Average (EWA) filter. Our rigorous mathematical analysis extends the texture resampling fram ...

5 Hardware accelerated rendering of CSG and transparency 82%

Michael Kelley , Kirk Gould , Brent Pease , Stephanie Winner , Alex Yen

Proceedings of the 21st annual conference on Computer graphics and interactive techniques July 1994

This paper describes algorithms for implementing accurate rendering of CSG and transparency in a hardware 3D accelerator. The algorithms are based on a hardware architecture which performs front-to-back Z-sorted shading; a multiple-pass algorithm which allows an unlimited number of Z-sorted object layers is also described. The multiple-pass algorithm has been combined with an image partitioning algorithm to improve efficiency, and to improve performance of the resulting hardware implementat ...

6 PixelFlow: the realization 80%

John Eyles , Steven Molnar , John Poulton , Trey Greer , Anselmo Lastra , Nick England , Lee Westover

Proceedings of the ACM SIGGRAPH/EUROGRAPHICS workshop on Graphics hardware August 1997

7 Three-dimensional medical imaging: algorithms and computer systems 80%

M. R. Stytz , G. Frieder , O. Frieder

ACM Computing Surveys (CSUR) December 1991

Volume 23 Issue 4

8 Procedural modeling & animation: A real-time cloud modeling, rendering, and animation system 80%

Joshua Schpok , Joseph Simons , David S. Ebert , Charles Hansen

Proceedings of the 2003 ACM SIGGRAPH/Eurographics Symposium on Computer Animation July 2003

Modeling and animating complex volumetric natural phenomena, such as clouds, is a difficult task. Most systems are difficult to use, require adjustment of numerous, complex parameters, and are non-interactive. Therefore, we have developed an intuitive, interactive system to artistically model, animate, and render visually convincing volumetric clouds using modern consumer graphics hardware. Our natural, high-level interface models volumetric clouds through the use of qualitative cloud attributes ...

9 Image-based transparency and refraction: Acquisition and rendering of transparent and refractive objects 80%

Wojciech Matusik , Hanspeter Pfister , Remo Ziegler , Addy Ngan , Leonard McMillan

Proceedings of the 13th Eurographics workshop on Rendering July 2002

This paper introduces a new image-based approach to capturing and modeling highly specular, transparent, or translucent objects. We have built a system for automatically acquiring high quality graphical models of objects that are extremely difficult to scan with traditional 3D scanners. The system consists of turntables, a set of cameras and lights, and monitors to project colored backdrops. We use multi-background matting techniques to acquire alpha and environment mattes of the object from mul ...

10 Interactive manipulation and display of surfaces in four dimensions 80%

David Banks

Proceedings of the 1992 symposium on Interactive 3D graphics June 1992

11 Direct WYSIWYG painting and texturing on 3D shapes 77%

Pat Hanrahan , Paul Haeberli

ACM SIGGRAPH Computer Graphics , Proceedings of the 17th annual conference on Computer graphics and interactive techniques September 1990

Volume 24 Issue 4

12 Design of the Mneme persistent object store 77%

J. Eliot B. Moss

ACM Transactions on Information Systems (TOIS) April 1990

Volume 8 Issue 2

The Mneme project is an investigation of techniques for integrating programming language and database features to provide better support for cooperative, information-intensive tasks such as computer-aided software engineering. The project strategy is to implement efficient, distributed, persistent programming languages. We report here on the Mneme persistent object store, a fundamental component of the project, discussing its design and initial prototype. Mneme stores objects

13 Cg: a system for programming graphics hardware in a C-like language 77%

William R. Mark , R. Steven Glanville , Kurt Akeley , Mark J. Kilgard

ACM Transactions on Graphics (TOG) July 2003

Volume 22 Issue 3

The latest real-time graphics architectures include programmable floating-point vertex and fragment processors, with support for data-dependent control flow in the vertex processor. We present a programming language and a supporting system that are designed for programming these stream processors. The language follows the philosophy of C, in that it is a hardware-oriented, general-purpose language, rather than an application-specific shading language. The language includes a variety of facilitie ...

14 blue-c: a spatially immersive display and 3D video portal for telepresence 77%

Markus Gross , Stephan Würmlin , Martin Naef , Edouard Lamboray , Christian Spagno , Andreas Kunz , Esther Koller-Meier , Tomas Svoboda , Luc Van Gool , Silke Lang , Kai Strehlke , Andrew Vande Moere , Oliver Staadt

ACM Transactions on Graphics (TOG) July 2003

Volume 22 Issue 3

We present *blue-c*, a new immersive projection and 3D video acquisition environment for virtual design and collaboration. It combines simultaneous acquisition of multiple live video streams with advanced 3D projection technology in a CAVE™-like environment, creating the impression of total immersion. The blue-c portal currently consists of three rectangular projection screens that are built from glass panels containing liquid crystal layers. These screens can be switched from a whiti ...

15 Shadow matting and compositing 77%

Yung-Yu Chuang , Dan B Goldman , Brian Curless , David H. Salesin , Richard Szeliski

ACM Transactions on Graphics (TOG) July 2003

Volume 22 Issue 3

In this paper, we describe a method for extracting shadows from one natural scene and inserting them into another. We develop physically-based shadow matting and compositing equations and use these to pull a *shadow matte* from a source scene in which the shadow is cast onto an arbitrary planar background. We then acquire the photometric and geometric properties of the target scene by sweeping oriented linear shadows (cast by a straight object) across it. From these shadow scans, we can con ...

16 3D graphics and the wave theory 77%

Hans P. Moravec

ACM SIGGRAPH Computer Graphics , Proceedings of the 8th annual conference on Computer graphics and interactive techniques August 1981

Volume 15 Issue 3

A continuing trend in computer representation of three dimensional synthetic scenes is the ever more accurate modelling of complex illumination effects. Such effects provide cues necessary for a convincing illusion of reality. The best current methods simulate multiple specular reflections and refractions, but handle at most one scattering bounce per light ray. They cannot accurately simulate diffuse light sources, nor indirect lighting via scattering media, without prohibitive increases in ...

17 Pixel-planes 5: a heterogeneous multiprocessor graphics system using processor-enhanced memories 77%

Henry Fuchs , John Poulton , John Eyles , Trey Greer , Jack Goldfeather , David Ellsworth , Steve Molnar , Greg Turk , Brice Tebbs , Laura Israel

ACM SIGGRAPH Computer Graphics , Proceedings of the 16th annual conference on Computer graphics and interactive techniques July 1989

Volume 23 Issue 3

18 Multi-resolution representations: OpenGL volumizer: a toolkit for high quality volume rendering of large data sets 77%

Praveen Bhaniramka , Yves Demange

Proceedings of the 2002 IEEE symposium on Volume visualization and graphics October 2002

We present the OpenGL Volumizer API for interactive, high-quality, scalable visualization of large volumetric data sets. Volumizer provides a high-level interface to OpenGL hardware to allow application writers and researchers to visualize multiple gigabytes of volumetric data. Use of multiple graphics pipes scales rendering performance and system resources including pixel-fill rate and texture memory size. Volume roaming and multi-resolution volume rendering provide alternatives for interactive ...

19 Parallel rendering: Distributed rendering of interactive soft shadows 77%

M. Isard , M. Shand , A. Heirich

Proceedings of the Fourth Eurographics Workshop on Parallel Graphics and Visualization September 2002

Recently several distributed rendering systems have been developed which exploit a cluster of commodity computers by connecting host graphics cards over a fast network to form a compositing pipeline. This paper introduces a new algorithm which takes advantage of the programmable compositing operators in these systems to improve the performance of rendering multiple shadow-maps, for example to produce approximate soft shadows. With an nVidia GeForce4 Ti graphics card the new algorithm reduces the ...

20 Shading and shaders: Efficient rendering of spatial bi-directional reflectance distribution functions 77%

David K. McAllister , Anselmo Lastra , Wolfgang Heidrich

Proceedings of the ACM SIGGRAPH/EUROGRAPHICS conference on Graphics hardware September 2002

We propose texture maps that contain at each texel all the parameters of a Lafortune representation BRDF as a compact, but quite general surface appearance representation. We describe a method for rendering such surfaces rapidly on current graphics hardware and demonstrate the method with real, measured surfaces and hand-painted surfaces.We also propose a method of rendering such spatial bi-directional reflectance distribution functions using prefiltered environment maps. Only one set of maps is ...

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